

What is claimed is:

1. A light emitting diode comprising:

a light emitting structure having a plurality of light emitting layers
5 which generate light in responsive to injection current;

a transparent conductive oxide layer formed on said light emitting
structure;

a metal reflective layer formed on said transparent conductive oxide
layer; and

10 a conductive base substrate formed on said metal reflective layer.

2. The light emitting diode according to claim 1, wherein said
conductive base substrate is selected from the group consisting of
copper, aluminum, SiC, AlN and silicon.

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3. The light emitting diode according to claim 1, wherein said
transparent conductive oxide layer is selected from the group
consisting of In_2O_3 , SnO_2 , CdO , ZnO , ITO, CTO, CuAlO_2 , CuGaO_2
and SrCu_2O_2 .

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4. The light emitting diode according to claim 1, wherein said metal
reflective layer is selected from the group consisting of Au, Al and
Ag.

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5. The light emitting diode according to claim 1, further comprising a
metal bonding layer formed in between said conductive base

substrate and said metal reflective layer.

5 6. The light emitting diode according to claim 5, wherein said bonding layer is selected from the group consisting of In, Au-Sn alloy, Au-Si alloy, Pb-Sn alloy and Au-Ge alloy, PdIn.

10 7. The light emitting diode according to claim 5, further comprising a diffusion barrier layer formed in between said metal reflective layer and said metal bonding layer.

15 8. The light emitting diode according to claim 7, wherein said diffusion barrier layer is selected from the group consisting of conductive oxide layer, refractory metal layer, and refractory metal silicide.

9. A light emitting diode comprising:
a conductive base substrate;
a light emitting structure having a plurality of light emitting layers which generate light in responsive to injection current;

20 a transparent conductive oxide layer formed on said light emitting structure;

a metal reflective layer formed on said transparent conductive oxide layer; and

25 a metal bonding layer formed in between said conductive base substrate and said metal reflective layer so as to bond said conductive base substrate and said light emitting structure.

- 5 10. The light emitting diode according to claim 9, wherein said
conductive base substrate is a heat dissipation and electrixal
conductive layer selected from the group consisting of copper,
aluminum, SiC, AlN and silicon.
- 10 11. The light emitting diode according to claim 9, wherein said
transparent conductive oxide layer is selected from the group
consisting of In_2O_3 , SnO_2 , CdO , ZnO , ITO, CTO, CuAlO_2 , CuGaO_2
and SrCu_2O_2 .
- 15 12. The light emitting diode according to claim 9, wherein said metal
reflective layer is selected from the group consisting of Au, Al and
Ag.
- 20 13. The light emitting diode according to claim 9, wherein said metal
bonding layer is selected from the group consisting of In, Au-Sn
alloy, Au-Si alloy, Pb-Sn alloy and Au-Ge alloy, PdIn.
- 25 14. The light emitting diode according to claim 13, further
comprising a diffusion barrier layer formed in between said metal
reflective layer and said metal bonding layer.
15. The light emitting diode according to claim 14, wherein said
diffusion barrier layer is selected from the group consisting of
conductive oxide layer, refractory metal layer, and refractory metal

silicide.

- 16 A method of manufacturing a light emitting diode, comprising the
5 steps of:
providing a light emitting diode epi-layers which has a plurality of
III--V compound semiconductor layers grown on a temporary substrate;
forming a transparent conductive oxide layer atop said epi-layers;
forming a metal reflective layer on said transparent conductive
10 oxide layer :
providing a base substrate having a first ohmic contact metal layer
formed on one side surface and a second ohmic contact metal formed
on the other side surface, wherein said first ohmic contact metal layer
is served as a first electrode;
15 depositing a metal bonding layer on said second ohmic contact
metal layer or on said metal reflective layer;
using said metal bonding layer to adhere said epi-layers with said
base substrate;
removing said temporary substrate; and
20 forming an ohmic contact metal layer on an exposed surface of
said epi-layers which serves as a second electrode.

17. The method according to claim 16, after said step of forming a
metal reflective layer and before said steps of adhering said LED
25 epi-wafer with said base substrate further comprising a step of
forming a diffusion barrier on said metal reflective layer so as to

prevent said metal bonding layer from reacting with said metal reflective layer.

18. The light emitting diode according to claim 16, wherein said conductive base substrate is a heat dissipation and electrical conductive layer selected from the group consisting of copper, aluminum, SiC, AlN and silicon.

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